

OK to  
enter the  
Sub. Spec.

C.F.

TITLE OF THE INVENTION

CHANNEL ESTIMATION IN A CELLULAR COMMUNICATION SYSTEM

BACKGROUND OF THE INVENTION

Technical Field



**[0001]** The present invention relates to a method and circuitry for channel estimation in a cellular communication system.

**[0002]** The invention is particularly concerned with a cellular communication system in which data is transmitted as a plurality of data symbols over a sequence of time slots. As is known, in a CDMA system, data is encoded for transmission by modulating data symbols to be transmitted by a unique spreading code for each of a plurality of communication channels. Within each cell of a cellular communication system, spreading codes allow for a plurality of different mobile stations to communicate with a base station on selectively coded channels.

**[0003]** When a signal is transmitted between a base station and a mobile station (either on the uplink or the downlink), the signal receiving unit needs to establish from the signal which it has received some information about the communication path along which the signal has travelled. This is referred to herein as "channel estimation" and is carried out in a channel estimation unit which generates a channel impulse response. Various techniques are known for channel estimation. The channel impulse response is required in order to properly decode and demodulate incoming data.

**[0004]** In an article in the IEEE Journal a Selected Areas in Communications entitled "A Soft-Output Bidirectional Decision Feedback Equalization Technique for TDMA" (11 (1993) September, No 7) a bidirectional adaptive equalization technique that takes advantage of the periodic